

In the matter of  
United States Patent  
Application no.  
10/509,098

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### STATUTORY DECLARATION

I, Bruce Archibald Short, of 61 Kiwi Esplanade, Mangere Bridge, Auckland, New Zealand, company director, do solemnly and sincerely declare:

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1.

I am the managing director and principle shareholder of B A Short Limited (hereinafter referred to as "BAS"), a company registered under the laws of New Zealand. Since 1984 BAS has manufactured attachments for earthmoving machinery, including front end loaders, also known as diggers. The attachments include buckets for front end loaders and so-called 'quick hitches' for the rapid attachment of different implements (including buckets) to front end loaders. BAS also manufactures and repairs attachments and implements of the same kind.

20 2.

I have personally been involved in the earthmoving industry continuously since 1960. Initially I carried on a business as an earthmoving contractor through Rewiti Farms Ltd ("Rewiti"). Rewiti was engaged in all types of earthmoving including the construction and maintenance of roads and of the earthworks around building sites, bridges, railway lines and the like. For this work, we owned and operated a variety of machinery including bulldozers, scrapers, motor graders and front end loaders. Initially, due to the fact that the business was small scale, I often personally operated all of these machines and became skilled and experienced at this. Also, from the outset, Rewiti constructed implements to my design for the machines that we used, including buckets for front end loaders and tractor-towed grader blades. Over time the business, particularly the manufacturing section, grew and we began to sell our products to other operators. My time was taken up more in managing Rewiti and designing the products that we built. By 1989 we had virtually stopped

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earthmoving operations and were engaged fulltime in manufacturing the implements. In that year the business (though not the company) was closed down due to financial difficulties.

5 3.

In the course of operating the business of Rewiti, we employed a maximum number of 16 employees. In addition to this, we used subcontractors from time to time. I believe that it is relevant to note here that there are many businesses of comparable small size in New Zealand, a country of about 4,000,000 inhabitants.

10 From my experience, I believe in fact that businesses of about this size, at least in the earthmoving industry, would be the rule rather than the exception in New Zealand. Whether that is accurate or not, I believe that it had the result, in my case, that I developed extensive first hand knowledge and experience of the operation of all of the machines that we used in the 29 years that the business was in existence.

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After the business was closed down, I worked for a year for Smith & Davies, an earthmoving company in Auckland. My job there involved principally the repair of buckets and other implements including quick hitchers.

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In 1993, I began to manufacture quick hitches for my own account through BAS.

The business has prospered. We currently employ 30 staff. In the last financial year, we produced about 550 quick hitches of various sizes and about 800 buckets

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for front end loaders. We also repaired about 150 buckets.

6.

I believe that I have substantial knowledge and experience of the earthmoving industry, including the way that machinery supplied for the industry is used. I also believe that, in order for the products of BAS to remain competitive, I have had to keep aware of new developments in the industry. I have in fact developed several improvements to the design of the products, some of which have been the subject of patent applications, both in the United States and elsewhere. I currently have a

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patent application, no. 10/532,654 in the United States, covering a design for a quick hitch.

7.

6 I have read United States patents no. 4521980 ("Solaja"), 4809449 (also to Solaja), and the specification of this United States Patent Application serial no. 10/509,098 ("Sieling"). I have been asked to comment on certain aspects of these documents.

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10 Turning to the Solaja patent no. 4521980, this document describes an assembly that can be attached to the bucket of a front end loader and that enables the front end loader to be used for grading and levelling. The assembly comprises what Solaja refers to as a 'hollow body' (12 in the drawings) to which is attached a 'blade member' 20. I've had some experience in reading patent documents and I've no  
15 doubt that most practical men would understand that the 'hollow body' would usually be a commercially available steel pipe and the 'blade member' would be a commercially available component of hardened steel that would be referred to in the industry as a cutting edge or blade. Solaja proposes to mount the pipe on the bucket by cutting a slot in the pipe. The cutting edge of the bucket is seated in this  
20 slot. The pipe is held in place on the bucket by a chain.

9.

Solaja describes two modes of using the apparatus. First, as shown in Figure 1 of his drawings, the bucket 10 is tilted to a position in which the cutting edge 20 is in a  
25 grading position in which it cuts the surface of the earth, thereby levelling it, when the front end loader is moving backwards. In the second mode of use, shown in Figure 2, the bucket is tilted to a position in which the pipe is in contact with the earth, serving to smooth it out when the front end loader is moving backwards. The drawing shows that the cutting edge is lifted well above the surface of the earth in  
30 this operation. For reasons discussed below, I believe that it is significant that Solaja does not suggest that the device can be used with the pipe in contact with the ground and the cutting edge digging in to the earth.

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To understand my further comments, I need to explain that it is common practice in earthmoving operations around building sites to use the bucket of a front end loader as a leveller and smoother, without anything attached to the bucket. This is referred to briefly in the first paragraph of Solaja's patent. In this practice, the bucket is tilted so that its cutting edge cuts into the ground, thereby levelling it. This can be done when the front end loader is moving backwards or forwards. Obviously, the bucket needs to have a straight cutting edge if it is to be used in this way. (Some buckets have, for example, V-shaped cutting edges and or teeth mounted on the cutting edge, and would not be suitable for grading). In a second mode of use, the bucket is tilted to a position in which the floor of the bucket is in contact with the earth. The bucket itself thus smoothes the earth out in the same way as Solaja's pipe.

11.

Using a front end loader in the way that I have just described is a rough-and-ready, but nevertheless common, method of doing small grading or levelling jobs on buildings sites. It's used, for example, to level and smooth out earth that has been dug out around foundations, trenches and the like. However, it's not without disadvantages. It's hard on the equipment. (One of our common repair jobs at BAS is to repair the floors and cutting edges of buckets that have been worn away as a result of the practice). Another disadvantage is that it doesn't do a particularly good job. The reasons for this are discussed below but I believe it true to say that it is quite unsuitable for a job that requires a properly level surface such as would be needed, for example, on a road. It would be necessary to use a proper grader for this purpose. Solaja's apparatus would, in my opinion, be no better and I don't believe that any experienced person would think it suitable for road grading.

12.

I also don't believe that a front end loader, whether or not equipped with Solaja's apparatus, would be suitable for the levelling operation described in the Stelling patent application. Stelling's description makes it clear that his apparatus is able to control the height of the cutting edge to an accuracy of about 1 mm. I have had no

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experience in broadacre farming but, if this the degree of levelness that is aimed at, it far exceeds the ability of a front end loader to achieve it. This would be equally true of a loader equipped with the Solaja apparatus. No road or other earthworks that I have ever worked on has required this degree of accuracy.

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12.

To understand my reasons for saying these things, it is necessary to briefly describe the part of the hydraulic system of a front end loader that controls the operation of the bucket. In all front end loaders that I know of, the bucket is mounted, through  
10 suitable pivot pins, on the front ends of a pair of lift arms. The lift arms are welded together by suitable cross members to form a single rigid structure. The rear ends of the lift arms are joined, again through pivot pins, to the frame of the loader. The lift arms are lifted or lowered by a first hydraulic ram (or pair of rams). The bucket is tilted up or down by a second hydraulic ram (or pair of rams).

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13.

When a front end loader is to be used for a levelling operation, the bucket is suspended above the ground by the lift arms of the loader, with the cutting edge in its working position to cut the ground. Both the tilt ram(s) and the lift ram(s) must be  
20 used for this purpose so that the bucket is effectively locked rigidly on the arms and the arms are effectively locked rigidly on the loader chassis. The entire rig, comprising the bucket, arms and chassis thus forms an essentially rigid structure. As the loader moves over even the smoothest ground, its wheels inevitably traverse undulations in the ground which tend to lift or lower the front wheels relative to the  
25 back wheels. This movement is translated to the bucket and is in fact magnified in proportion to the distance between the wheels and the bucket. The operator compensates for this by extending or retracting the lift ram(s) to lift or lower the bucket. But this compensation is rough and ready. If an accuracy of 1 mm, as discussed above, is the basis of comparison, I would say that even a skilled  
30 operator would be unable to achieve an accuracy much better than about 10 mm. By this I mean to say that, in practice, an operator has to see that the cutting edge of the bucket is rising or falling and would be unable to make a correction before the cutting edge has risen or fallen less than about 10 mm, at least on a consistent

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basis. Furthermore, it would be impossible for the operator of a front end loader, using the lift arm(s) to control the lifting or lowering of the bucket to an accuracy of much less than about 10 mm. The end result is that the correction is necessarily a rough one and, as I believe most operators would confirm, it is difficult to avoid  
5 making corrugations in the surface of ground that is being levelled with a front end loader. To some extent, these corrugations can be smoothed out by one or more further passes of the bucket in the way that I have described.

14.

10 Another disadvantage of using the bucket for grading in the way that I have described, is that any sideways tilting of the loader, which is inevitable when the wheels on one side or the other of the loader ride over undulations in the ground, are transmitted to the cutting edge of the bucket through the lift arms which, as I have said, are rigidly connected together. This has the result, as operators know,  
15 that one end of the cutting edge of the bucket commonly digs into the ground while the other end is lifted. Front end loaders are unable to compensate for this because, as I have said, the two lift arms are joined together to form a rigid structure. And when it happens, several passes may be required to level the ground. For the same reason, a front end loader could not successfully form a  
20 camber in a road.

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I have been unable to find any mention in Solaja's patent of carrying out an operation with the pipe being dragged over the ground while, at the same time, the  
25 blade is cutting into the ground. In my view this is not surprising because it be impractical to do so. The blade height would still have to be controlled by the lift arms and because of this it would not be possible, in practice, to control the blade height with any accuracy. I believe that, due to its nature, the apparatus is essentially intended to be used on building sites in the same way as the bucket of a  
30 front end loader, as I have described, i.e hanging from the lift arms. Even if it appears obvious that the apparatus could be so used, it would be unsuitable for anything but coarse grading. The sideways tilting of the loader that I have mentioned would have the result that one end of the pipe and blade would dig into

the ground while the other end would be lifted. In fact, this tendency would be magnified (compared to grading with a bucket alone) due to the length of the pipe and blade.

8 16.

Solaja does not specifically suggest that his apparatus would be useful for road building or other purposes where accurate work is essential. So it seems to me to be reasonable to conclude that the absence of any mention of grading or levelling with the pipe resting on the ground is because Solaja would have known that it is impractical to do so. My view also seems to be supported by the fact that Solaja obtained a second US patent no. 4809449. The later patent describes a grading/smoothing apparatus that is used in substantially the same way as the apparatus shown in the earlier patent. The apparatus in the later patent is, however, designed to be mounted on a quick hitch (instead of a bucket) carried on a front end loader. Despite the fact that the later patent is dated nearly four year after the earlier patent no. 4521980, there is still no mention in the later patent that of using the apparatus in a grading or levelling operation with the pipe resting on the ground.

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20 The use of Solaja's apparatus would have two important advantages. First, the apparatus would save wear and tear on the bucket. Second, as mentioned by Solaja, the apparatus can be wider than the bucket and a grading job could thus be done quicker. However, I believe that the Solaja apparatus, while it might well be useful around a construction site, would be quite unsuitable for the fine grading required in road building or levelling fields for growing pasture, as described in the Sleiling application. Although it might appear that Solaja's apparatus could be used for that purpose, no experienced operator would think of doing so. Actually, in my view, an experienced operator using the bucket of a front end loader in the way that I have described above would make just as good a job of grading as he would with the Solaja apparatus attached.

And I further declare that all statements made herein of my own knowledge are true

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and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false  
5 statements may jeopardize the validity of the application or any patent issued thereon.

.....B Short.....

Date: 27 march 06.

10 Declarant: Bruce Archibald Short

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